DOCUMENT RESUME

ED 364 558 TM 020 710

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TITLE Relationship of the K-BIT and SIT-R in a Gifted Sample.
PUB DATE Aug 92
NOTE 15p.; Paper presented at the Annual Meeting of the American Psychological Association (100th, Washington, DC, August 14-18, 1992). For related document, see TM 020 712.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; *Academically Gifted; Children; Comparative Testing; Correlation; Elementary Education; *Elementary School Students; Females; *Intelligence Tests; Males; *Talent
IDENTIFIERS *Kaufman Brief Intelligence Test; *Slosson Intelligence Test (Revised)

ABSTRACT

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Relationship of the K-BIT and SIT-R in a Gifted Sample

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Running head: K-BIT/SITR

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Abstract

The Kaufman Brief Intelligence Test and the Slosson Intelligence Test-Revised were administered in counterbalanced order to a sample of 32 school identified gifted and talented students (18 males and 14 females). Mean age was 11 years, 3 months. The K-BIT IQ Composite and SIT-R Total Standard Score produced a correlation of .61 ($p < .001$). Similarly, K-BIT subtests of Vocabulary and Matrices correlated significantly with the SIT-R Total Standard Score, .62 ($p < .001$) and .40, ($p < .01$), respectively. T-tests for related samples were significant for the K-BIT IQ Composite/SIT-R comparison ($t = 8.54$, $p < .001$) as well as for the Vocabulary/SIT-R and Matrices/SIT-R comparisons with the K-BIT scores significantly lower than the SIT-R score.

The Kaufman Brief Intelligence Test (K-BIT; Kaufman & Kaufman, 1990) and the Slosson Intelligence Test-Revised (SIT-R; Slosson, 1991) are both designed as screening tests of cognitive abilities to be used when an estimate of ability is needed with a minimum of time for test administration. Both tests, therefore, are designed for screening purposes and require less than 30 minutes to administer. Since these tests are likely to be used in both school and clinical settings, it is important to determine their relationship to each other using both clinical and non-clinical samples.

The K-BIT spans the age range of 4 to 90 years and consists of two subtests, Vocabulary and Matrices. Vocabulary requires verbal responses to (a) expressive vocabulary items in which the individual provides the name for a pictured object and (b) definitions (administered to individuals ages 8 years and older) in which the individual provides the word that best fits two clues (a descriptive phrase and partial spelling of the word). Age based standard scores (mean of 100, standard deviation of 15) are provided for each subtest and the overall K-BIT IQ Composite. Test items are grouped in units. Starting points are based on the individual's chronological age and the discontinue rule is failure on every item in one unit. The

standardization sample consisted of 2,022 individuals with approximately equal numbers of males and females at each age level. The sample was designed to match 1990 U. S. census estimates and stratified on the basis of geographic region, socioeconomic status and race or ethnic group. The final sample generally approximates the census estimates on these variables. Split-half reliability estimates corrected by the Spearman-Brown formula range from .88 to .98 by age level for the K-BIT IQ Composite. Test-retest reliability coefficients for 232 individuals ages 5 to 89 tested at a mean interval of 21 days range from .92 (ages 5-12) to .95 (ages 20-54 and 55-89) for the K-BIT IQ Composite. Twenty validity studies comparing the K-BIT with other measures of ability and achievement are reported in the test manual and correlation coefficients between the K-BIT IQ Composite and the K-ABC Mental Processing Composite ranged from .58 to .69. Correlation coefficients between the K-BIT IQ Composite and the Wechsler Intelligence Scale for Children-Revised (WISC-R) Full Scale IQ and Wechsler Adult Intelligence Scale-Revised (WAIS-R) Full Scale IQ were .80 and .75, respectively.

The SIT-R covers the age range of 4 years to 18+ years and consists of items designed to measure vocabulary, general information, similarities and

differences, comprehension, quantitative, and auditory memory. Starting points are based on chronological age and a basal and ceiling procedure is utilized with 10 consecutive passes forming the basal and 10 consecutive failures comprising the ceiling. A Total Standard Score or IQ which has the same mean (100) and standard deviation (16) at all ages is provided. The standardization sample consisted of 1,854 individuals and was designed to match 1990 U. S. census estimates on the basis of the educational and social characteristics of individuals rather than geographical representation. Goodness of fit tests for each age level show no significant differences between the standardization sample and the census estimates for educational level. The Split-half reliability estimate with the Spearman-Brown correction for the standardization sample was .97. Kuder Richardson 20 estimates ranged from .88 to .97. Test-retest reliability for a sample of 41 individuals tested at one week intervals was .96. Correlations between the SIT-R and the WISC-R ranged from .61 (ages 9-11) to .92 (ages 6-8) with an overall correlation of .84 for the sample of 234 individuals ranging in age from 6 to 16 years.

Purpose of the Study

Since the K-BIT and SIT-R have been in use for a short period of time, studies comparing the two tests could not be located. Several studies comparing the K-BIT and the Slosson Intelligence Test (SIT) are reported in the K-BIT manual. While studies utilizing nonhandicapped samples produced K-BIT IQ Composite-SIT correlations ranging from .50 to .76, one study of 55 gifted students ages 8-13 years produced a correlation of .44 between the two tests with the K-BIT IQ Composite mean score 11.9 points lower than the SIT IQ. Therefore, the purpose of the present study was to compare the performance of a sample of school-identified gifted and talented students on the K-BIT and SIT-R.

Method

Subjects

The subjects for this study consisted of 32 gifted and talented students (18 males and 14 females) attending a summer enrichment program at a midwestern university. Each student had previously been identified as gifted and talented by the respective school district using criteria including academic achievement, cognitive ability, creativity, and leadership skills. The subjects ranged in age from 8 years, 9 months to 14 years, 2 months with a mean age of 11 years, 3 months.

Procedure

The K-BIT and SIT-R were administered in counterbalanced order by school psychologists trained in the administration and interpretation of intelligence tests. Testing for each student took place the same day and required approximately 60 to 75 minutes.

Results

Mean scores ranged from 114.25 (K-BIT Vocabulary subtest) to 131.28 (SIT-R IQ). A restricted range in scores was evident as standard deviations ranged from 8.95 (K-BIT IQ Composite) to 10.04 (K-BIT Matrices subtest). Since the sample had been identified previously as gifted and talented such a result was not unexpected. The means, standard deviations, and ranges for the K-BIT and SIT-R are presented in Table 1.

Insert Table 1 about here

Pearson product moment correlations were calculated separately for the K-BIT and for both tests with each other. Correlations were corrected for restriction in range using the formula developed by Guilford (1954). K-BIT intercorrelations were all significant ($p < .01$) and ranged from .52 (Vocabulary/Matrices) to .93 (Vocabulary/IQ Composite).

The K-BIT IQ Composite and SIT-R Total Standard Score or IQ produced a correlation of .79, suggesting a strong relationship between the two tests. In addition, the Vocabulary and Matrices correlations with the SIT-R IQ were also significant ($p < .01$) at .80 and .57, respectively. The complete table of correlations is presented in Table 2.

Insert Table 2 about here

Differences in mean standard scores were analyzed by t-tests for related samples. Significant results were obtained for the K-BIT IQ Composite/SIT-R IQ ($t = 8.54$, $p < .001$). The K-BIT IQ was significantly lower than the SIT-R score (12.22 points). Similar results were obtained in comparing the K-BIT subtest scores with the SIT-R IQ. The Vocabulary/SIT-R IQ difference of 17.03 points and the Matrices/SIT-R IQ difference of 11.59 points were both significant ($t = 11.96$, $p < .001$ and $t = 11.59$, $p < .001$, respectively) with the K-BIT scores lower than the SIT-R IQ.

Discussion

In this sample of gifted and talented students the K-BIT and SIT-R related strongly to each other with an overall correlation of .79. Significant differences

were indicated in mean scores, however, with the mean K-BIT IQ Composite 12.22 points lower that the SIT-R IQ. Both K-BIT subtests (Vocabulary and Matrices) related significantly to the SIT-R IQ with Vocabulary showing a strong relationship (r = .80) and Matrices a moderate relationship (r = .57).

The results of this study suggest that the two tests are measuring similar constructs. Scores, however, are not equivalent with students obtaining significantly higher scores on the SIT-R. Similarly, a study of gifted students, reported in the K-BIT Manual, with the Slosson Intelligence Test reported a moderate correlation (r = .44) but a 12 point difference in test means with the Slosson mean at 134.1 and the K-BIT IQ Composite of 122.2. Other studies with the Slosson, WISC-R, WAIS-R, and Kaufman Assessment Battery for Children in nonhandicapped samples showed differences of no more than five points between global scale scores.

Validity studies with the SIT-R are limited. In the Technical Manual a correlational study with the WISC-R is reported with no significant differences between mean WISC-R Full Scale IQ and SIT-R IQ. It is noted however, that there is a tendency for SIT-R IQ scores two standard deviations or more above the mean "to increase the difference from the WISC-R VIQ" (p. 6).

Since 22 of the 32 students in the current study had SIT-R IQ scores of this magnitude, the SIT-R score may be somewhat inflated. Whether the SIT-R produces "high" scores for gifted and talented students or the K-BIT produces "low scores" for such students remains an issue for further investigation. Until further studies are completed, practitioners should be aware that significant differences may exist between K-BIT and SIT-R scores with gifted and talented students.

While the potential difference in scores may be a factor in test selection, other factors should be considered also. Of the two tests, the SIT-R appears to be more verbal in nature as shown by the pattern of correlations with the K-BIT subtests. This is not unexpected as the SIT-R contains items designed to measure vocabulary, general information, similarities and differences, comprehension, quantitative, and auditory memory. For the practitioner desiring a verbal and nonverbal measure of ability, the K-BIT with separate Vocabulary and Matrices scores may be the instrument of choice.

The ceiling format of the SIT-R (10 consecutive failures) lengthened the testing time for many students. It was not uncommon for students to have several sequences of seven or eight consecutive failures before

meeting the discontinue criterion. While this produced a more indepth sample of behavior, it also increased the level of frustration and the time needed for testing. The item unit format of the K-BIT avoided this difficulty and streamlined the testing process.

As with any new test, additional studies are needed to verify the validity of both the K-BIT and the SIT-R. While the present study found strong relationships between the K-BIT and SIT-R, the sample size and age range of subjects was limited. Consequently, the relationships between the K-BIT and the SIT-R should be explored with additional samples of students exhibiting a variety of exceptionalities.

References

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Kaufman, A. S., & Kaufman, N. L. (1990). Kaufman Brief Intelligence Test. Circle Pines, MN: American Guidance Service.

Slosson, R. L. (1991). Slosson Intelligence Test-Revised. East Aurora, NY: Slosson Educational Publications.

Table 1.

Means, standard deviations and ranges for the K-BIT and SIT-R

	Mean	Standard Deviation	Range
K-BIT			
IQ Composite	119.06	8.95	94-136
Vocabulary	114.25	8.96	91-130
Matrices	119.64	10.04	99-136
SIT-R IQ*	131.28	9.44	108-146

*adjusted for mean of 100, standard deviation of 15

Table 2.

Intercorrelations among the K-BIT and SIT-R

	K-BIT		SIT-R
K-BIT	Vocabulary	Matrices	
Composite	.80(.91)***	.84(.93)***	.61(.79)***
Vocabulary		.34(.52)*	.62(.80)***
Matrices			.40(.57)**

Note. Correlations in parentheses are corrected for restriction in range.

*p < .05. **p < .01. ***p < .001.